Semi-soft FMIPv6 for 802.11 Network

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Abstract. Mobility support in the wireless network enables us to be served continuous service. Fast Handover for Mobile IPv6 (FMIPv6) is proposed to support a faster handover than that of Mobile IPv6. Unfortunately, FMIPv6 shows too long handover latency to serve smooth video traffic flows. We proposed semi-soft FMIPv6 handover to minimize the handover latency to serve video traffic efficiently. The proposed scheme clarifies the handover procedure by separating the handover preparation and the actual handover. We also clarify the use of L2 triggering by introducing four triggers and triggering time scheme. With our experimental implementation, the proposed scheme has shortened the handover latency below 50ms and this low handover latency helps to reduce the buffered packet size in access routers.

1 Introduction

Mobility support is a key feature in wireless network environment. Mobility support provides continuous service for mobile nodes when they move from one wireless point of attachment to another in a different subnet. In IEEE 802.11 wireless network, communication disruption period exists between current attachment point and new attachment point. And additional process time to update mobility information is required according to mobility support protocol. Handover latency is a traditional metric that measures network disruption period.

Mobile IPv6 (MIPv6)[1] is a well-known protocol to support mobility in IEEE 802.11 wireless network. Handover latency in MIPv6 is more than one second excluding layer 2(L2) handover latency and it is considered too long to serve multimedia service such as video traffic. Fast Handover for Mobile IPv6 (FMIPv6)[3] is proposed to shorten the handover latency as a micro-mobility approach. FMIPv6 provides a faster handover than MIPv6. According to [6], handover latency in FMIPv6 is about 160ms. FMIPv6 has reduced the handover latency, but the handover latency still has to be reduced further to serve multimedia service such as

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video smoothly. Moreover, buffering in an access router to provide seamlessness needs to be minimized.

In this paper, we propose semi-soft FMIPv6 handover to minimize the handover latency to support video traffic smoothly. In semi-soft FMIPv6 handover, we separate handover preparation and actual handover clearly. We can configure the address configuration and tunneling setup before actual handover is occurred during handover preparation phase, so we call semi-soft FMIPv6 handover. We perform experiment to verify the operation of proposed handover procedures in test bed.

2 Semi-soft FMIPv6 Handover

2.1 FMIPv6

FMIPv6 is proposed to reduce the handover latency of MIPv6. FMIPv6 predicts mobile movement and prepares the movement before actually the movement occurs. Fig. 1 shows the sequence of message for FMIPv6. In FMIPv6 over IEEE 802.11 network, FMIPv6 handover procedure is as follows:

1) MN performs a scan to see which APs are available. The result of the scan is a list of APs including physical layer information, such as signal strength. MN selects one or more APs by its local policy.
2) MN exchanges Router Solicitation for Proxy (RtSolPr) and Proxy Router Advertisement (PrRtAdv) with the current AP to get the new subnet prefix of the selected AR.
3) MN itself configures its prospective new CoA (NCoA) based on the new subnet prefix.

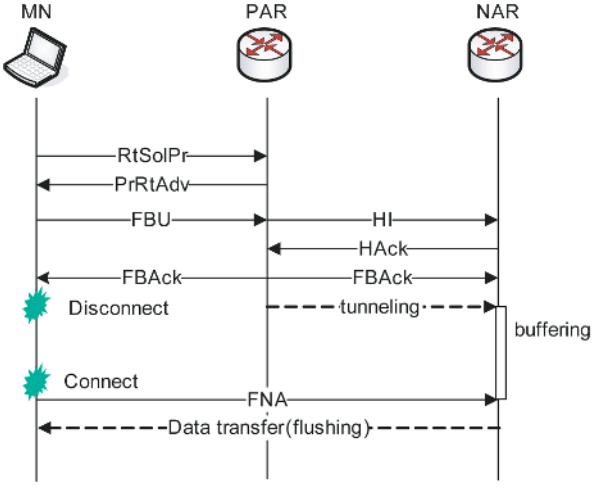

Fig. 1. The handover procedure of FMIPv6